DOCUMENT RESUME

ED 241 681 CE 038 310

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TITLE The IBM Project to Train the Handicapped.
INSTITUTION International Business Machines Corp., Gaithersburg, Md. Federal Systems Div.
SPONS AGENCY Rehabilitation Services Administration (ED), Washington, DC.
PUB DATE [80]
GRANT 2GP-60319-07
NOTE 15p.
PUB TYPE Reports - Descriptive (141)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Adults; Business; *Business Education; Computer Oriented Programs; Cooperative Planning; *Cooperative Programs; Data Processing; Educational Cooperation; Job Training; Postsecondary Education; Program Design; Program Development; Program Effectiveness; Program Implementation; *Programing; *School Business Relationship; *Severe Disabilities; Team Teaching; *Vocational Rehabilitation
IDENTIFIERS *IBM Project to Train the Handicapped

ABSTRACT

In June 1980, about 285 severely handicapped people had learned to become business application programmers as a result of the IBM Project to Train the Handicapped. The program consists of 17 different projects sponsored by vocational rehabilitation (VR) agencies in 16 states. Designed to enable students to perform competitively as entry-level business application programmers, the typical project is a cooperative effort involving the joint efforts of the state VR agency, a business advisory committee, and a local training activity site staffed by a qualified programming instructor. Despite the fact that these training courses will last for only nine or ten months, those individuals participating in them should gain skills that are commensurate with those of individuals graduating with degrees in computer science. The reason behind the effectiveness of the IBM program is the fact that the individual projects are staffed by a community-based group of people, representing usually unrelated fields of activity, who form a team in which each member provides his or her expertise to make a unique contribution to the provision of job-oriented training for severely handicapped individuals. (MN)

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THE IBM PROJECT TO TRAIN THE HANDICAPPED

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This project was supported in part by the Rehabilitation Services Administration, Department of Education, Washington, D.C., under Award # 2GP-60319-07.

CE038310

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THE IBM PROJECT TO TRAIN THE HANDICAPPED

In June 1980, there will be about 285 severely handicapped people learning to be business application programmers as a result of this IBM Corporate/ Rehabilitation Services Administration program. They will be in seventeen different projects spronsored by the Vocational Rehabilitation (VR) agencies in sixteen states. There are seven more states that send students to these projects. Another five projects are in the early planning stages.

About 75 percent of the severely handicapped men and women in training will successfully complete the training course with about a point nine probability of securing employment as entry-level business application programmers. They will join over 300 severely handicapped individuals who have successfully completed other similar training courses between 1973 and today.

The curriculum for each training project is designed to enable the student to perform competitively as an entry-level business application programmer within the local data processing community. Nationally, the managers of graduates of these training projects describe them as being as good as other programmers with one to two year's experience, including computer sciences graduates. Successful graduates of these training courses are qualified entry-level business application programmers who happen to be handicapped. They are able to compete on an equal footing with other individuals with degrees in computer science also starting out as business application programmers. After two years, this equality still exists.

This first programming job is a major milestone for severely handicapped individuals. Many have been handicapped since birth, while others have

become handicapped through accident or illness. In most cases, they have had little expectation of getting jobs with significant salary and a good career path. For many, successfully completing the training course and getting a job will be the most significant objective they have achieved since becoming disabled.

> The question is this: How can a person successfully completing only a nine or ten month course be considered "as good as" a group of persons with degrees in computer science who are also entry-level business application programmers?

The answer lies in the unique combination of community talents that are applied in these training programs to provide the expertise needed to graduate well trained and motivated people.

IBM's part in these projects is to assist the state VR agency in planning and implementing a successful programmer training project. IBM provides information about the local programmer job market and projects in other states. A business advisory committee of data processing executives is recruited by IBM. Visits are arranged to several training sites. This allows one state to benefit from the experience of other states to avoid problems previously encountered by other states and to secure the guidance of the local business community in developing the training course.

A brief look at the structure of a typical project will show how they operate. A project typically is a combination of three major components:

a. State Vocational Rehabilitation Agency
b. Business Advisory Committee
c. Training Activity.

STATE VOCATIONAL REHABILITATION (VR) AGENCY

The VR agency has the legal responsibility to provide vocational training to handicapped residents of the state. Federal funds are used to provide this training in accordance with the federal regulations issued with the Rehabilitation Act of 1973, as amended. The decision to sponsor a programmer training project may take considerable time to reach -- as long as three years in the case of several states.

Having decided that the VR agency should sponsor a training project and how it will be funded, one of the VR supervisors is assigned as Project Director with management responsibility and authority for the training project. This individual is key to the successful operation of all aspects of the project. The role of this individual is described as he or she interacts with the other elements of the training project.

The major responsibilities of the Project Director include student recruitment, selection and placement. If these duties are performed in an orderly and organized manner, the training classes will consist of well qualified and motivated students and the attrition rate will be low. In those training projects where the training site is not a state facility, the function of the Project Director is more critical since other VR services will be needed by the students. This would include such services as the evaluation of students for driver training, providing the training and procuring any needed adaptive equipment for the vehicle.

The selection criteria for students differs among the training projects. They will, however, probably include the following criteria:

a. Above average intelligence - 110+ IQ

b. Reading level of 12th grade

c. High school graduate or equivalent

d. High school algebra.

Although some students far surpass these miminum criteria, the majority have little or no education beyond high school.

BUSINESS ADVISORY COMMITTEE - BAC

The fundamental reason that the successful graduates of these training projects are able to compete so well is that they are trained to meet the needs of the local data processing community. This focus is a result of the contribution of the BAC. The members of the BAC are senior data processing executives with major responsibility for hiring, training and managing programming personnel. The BAC usually performs its functions through subcommittees:

a. Curriculum

b. Evaluation

c. Application

d. Placement.

Curriculum - The initial function of the curriculum subcommittee is to provide direction to the training activity in the preparation of the curriculum. The instructor prepares a preliminary course outline for the consideration of the curriculum subcommittee. In some projects, this is based on a job description provided by the BAC for an entry-level programmer. This preliminary course outline, together with course outlines from two or three other training projects, is reviewed by the individual members in the process of developing the final course by the entire group. An on-the-job-training (OJT) module of 4 to 6 weeks is usually included.

A more complete discussion of this process is presented in the Training Activity section.

The curriculum subcommittee reviews the course materials at the end of each training cycle. In most projects, revisions are made to add new materials, to modify the presentation of materials and to improve the curriculum.

This subcommittee also provides guest lecturers at selected points in the training course and arranges for class visits to their installations. This provides the students with a background on industry requirements and an introduction to the real world of data processing.

The VR Project Director participates in the activities of the curriculum subcommittee. This provides him with a detailed understanding of the curriculum and the desires of the members of the subcommittee. This understanding influences the Project Director in the student recruitment and selection process. It also allows the Project Director to do a more effective job in monitoring the performance of the instructor.

Evaluation - Many training projects perform this function primarily as a means of ensuring that the graduates will meet the performance criteria of the BAC. In some projects this subcommittee is also an active participant in the final selection of students for the training course.

The evaluation subcommittee usually reviews the progress of the individual students at the completion of each major section of the training course. For example, the students in one training project were placed in one of four groups just prior to the start of the on-the-job-training phase:

a. Ready for OJT.

b. Delay OJT for 30 days with special training.

c. Provide after-class tutoring to correct specified training deficiencies.

d. Place student on two-week termination notice and reevaluation.

The Project Director is able, at the end of each evaluation cycle, to compare the BAC and Instructor evaluations of student performance. Differences in these evaluations are useful in identifying problems. For example, a student may be tense when interviewed by a BAC member and need some special training in interviewing techniques. Consistent differences between the BAC and Instructor evaluations need to be resolved.

Application - Some training projects include this function as part of the curriculum subcommittee. In any case, the BAC normally develops a number of application problems to be used as part of the class work. These can range from quite simple problems for the early stages of training to more complex problems to be programmed by a team of three or four students. In some cases, these application problems involve the maintenance of a program developed by another student. This demonstrates the desirability of good program documentation.

The BAC member providing the application problem usually reviews the resulting application programs prepared by the student. The results of the review may be provided to the student in writing during an individual meeting with the student or in a regular class session in which the BAC member discusses the programs in a more general manner.

The Project Director's primary involvement is to ensure that the application problems are properly incorporated in the training course. This involves working with both the curriculum subcommittee and the instructor.

Placement - The placement subcommittee assists the training project in two ways. It aids in developing job-seeking skills in the individual students and is involved in identifying job opportunities for the successful graduates.

The development of job-seeking skills is especially critical. Many of the students have never held a job. Most will have few incentives or major goals at the beginning of the training course. Members of this BAC subcommittee assist in developing student resumes, conduct mock interviews and review these interviews with the student.

The degree of involvement of this subcommittee in placement depends on the BAC members. In most projects, the members are happy to work with the Project Director and staff personnel, but they are unwilling to do the total job. The principal contribution of the BAC members is in getting the placement function operating in an organized and orderly manner. Also, the placement process is more effective when one businessman can tell another that he knows that the class graduates are thoroughly trained and are good entry-level programmers.

The role of the Project Director is critical in working with the placement subcommittee. Ideally, the project staff includes an individual with responsibility for recruitment and placement. Procedures are needed to identify potential employers and to take the actions necessary to acquaint these potential employers with the training project. Many projects publish a

monthly newsletter to maintain a flow of information to present and potential employers.

TRAINING ACTIVITY

It is virtually certain that the VR agency will not have access to a qualified programming instructor. The problems associated with recruiting and hiring such a person within the constraints and salary structure of a state Civil Service system may also be critical.

In December, 1979, thirteen training projects were in operation, with two other projects due to start training in the first quarter of 1980. There are a variety of approaches that are used in providing the training. Two projects are located at state-operated residential vocational rehabilitation centers, with Civil Service instructors. Five private non-residential rehabilitation centers provide training services to the state VR agency under contract or on a fee-for-service basis. One major private university, through a contract with the VR agency, provides the instructional staff and data processing support (including a classroom mini-computer) at the state residential rehabilitation center. Three training projects are located in the center city.

Once the training activity and training site are selected, an instructor is hired.

The instructor is responsible for the development of a preliminary course outline. The new instructor is provided with an appreciation of how other training projects are operating by IBM taking him to visit two or three other training projects. These projects are selected to provide the new

instructor with the opportunity to secure information about markedly different training programs that are meeting the needs of their local data processing communities for competent entry-level business application programmers. The three projects frequently used by one of the authors of this paper are selected for the following reasons:

a. The three training sites can be visited over a three-day period.

b. They include both residential and nonresidential rehabilitation centers and a center city training site.

c. One has a dedicated minicomputer, five CRT terminals and three printers in the classroom.

d. Two are organized in a traditional manner involving a stand-up instructor.

e. One has the class organized as a simulated programming department and promotes the use of written memoranda and student chairmen reporting the results of small committee problem-solving meetings to the class.

f. One has the course outline in the form of courses in the Department of Decision Sciences at the undergraduate level in the evening college of a major college of business.

The instructor is provided with the course material used at those training sites to use as an aid in developing the preliminary course ouline. This preliminary course outline, together with the course outlines from the other training sites, is given to the DPMA Curriculum Subcommittee for their review and suggestions for revision. The revision process is usually spread over the first training cycle.

The Project Director, having participated in the BAC review process, is in a position to ensure that the revisions are going to meet the desires of the BAC. This understanding will also be useful in monitoring the classroom training.

SUMMARY

The question that we have been addressing has been,

> "How can a person successfully completing only a nine or ten month course be considered "as good as" a group of persons with degrees in computer science who are also entry-level business application programmers?"

The answer is that a community based group of people, representing usually unrelated activities, form a team where each provides his expertise, makes a unique contribution to the provision of job-oriented training for the severely handicapped. The success of these projects depends upon this teamwork; the individuals receiving the training will be significantly less competent at graduation if any element of this team is missing or of sub-standard quality. A summary of these key elements follow.

Vocational Rehabilitation Project Director - This individual is key to the success of the training project in providing leadership and integrating the efforts of all involved. More specific contributions are the following:

a. Developing a realistic project plan and budget proposal

b. Identifying well-qualified candidates, thereby reducing attrition and allowing an expanded training program

c. Coordinating the delivery of rehabilitation services to the individuals during the course

d. Providing driver training to those requiring it and procuring any required vehicle adaptive equipment in phase with the course

e. Ensuring that the agreed-to changes desired by the BAC are incorporated in the training project

f. Being actively involved in the placement of successful graduates

g. Not expecting the BAC to do more than they are willing to volunteer.

Business Advisory Committee - The BAC members ensure that the project provides job-oriented training that will qualify the students to be competent entry-level programmers. Some of the specific contributions are the following:

a. Guiding the instructor in the development of a job-oriented curriculum

b. Providing application problems of increasing complexity for use in the course

c. Conducting mock interviews and critiquing student interview performance

d. Teaching students nonprogramming job skills and behavior

e. Providing intangible contributions due to working closely with the students, the instructor, the Project Director and other VR personnel

f. Becoming advocates to the business community on the capability and quality of the graduates.

Teaching Activity - The instructor, in addition to teaching, plays a key role in translating the guidance from the BAC into course content. While no two training project instructors teach exactly the same curriculum or conduct their course in exactly the same manner, they all contribute. Among their major contributions are the following:

a. Adapting the training to the needs of their students with a variety of handicaps

b. Building the confidence of individual students in themselves and in their ability as programmers

c. Responding to the results of the evaluation of an individual student's performance at check-points in the course

d. Ensuring that each student is performing to the level of his ability during the course.

Students - The major contribution of each successful graduate is in becoming a productive member of society. The personality changes that are seen by others serve as additional rewards to all who participate in the training program.

Nationally, the starting annual salary of the graduates during the last twelve months was from $12,000 to $18,000, with the average between $14,000 and $15,000 per year. These graduates will each be paying about $4,000 per year in federal, state and local taxes. Before going to work, they were receiving about $7,000 annually in federal and state tax-funded support and services. In addition to these tax dollar gains, there are also

immeasurable benefits that result from the change in life-style of these graduates. How much is it worth to one young man to change from a position of complete dependency - staying in bed five days a week - to working five days a week and helping support his family and himself?